

34. (Amended twice) The method of Claim 23, 61, 62, 63 or 64 in which said porous substrate of said flow-through device is composed of high density or ultra-high molecular weight polyethylene.

RECEIVED

SEP 14 2000

67. (Amended) The kit of Claim 66 in which the porous substrate is composed of high density or ultra-high molecular weight polyethylene.

TECH CENTER 1600/2900

### REMARKS

With this Amendment, Claims 10, 34 and 67 have been amended and Claims 1-11, 14, 15, 19-36, 40, 41, 44, 50-52 and 57-67 are pending in this Application.

### OBJECTION TO THE DRAWINGS

The Drawings stand objected to for allegedly containing informalities. Applicants have submitted formal Drawings with this response that correct the alleged informalities. In view of the foregoing, Applicants respectfully request that the objection to the Drawings be withdrawn.

### AMENDMENT OF THE CLAIMS

The modifier "ultra" now precedes the phrase "high molecular weight" in amended Claims 10, 34 and 67. The amendment of Claims 10, 34 and 67 is supported by the Specification (See, *e.g.*, page 12, lines 14-15) and does not introduce new matter. Accordingly, entry into the instant Application is proper and respectfully requested.

### THE REJECTIONS UNDER 35 U.S.C. § 112, FIRST PARAGRAPH

Claims 1-11, 14, 15, 19-36, 40, 41, 44, 50-52 and 57-67 stand rejected under 35 U.S.C. § 112, first paragraph, for lack of written description for not conveying to one skilled in the relevant art that the inventors, at the time the application was filed had possession of the claimed invention. Applicants respectfully traverse the rejections.

The written description requirement is satisfied if the specification clearly conveys to those skilled in the art, that the applicant was in possession of the invention defined by the current claims as of the filing date. *Vas-Cath, Inc. v. Mahurkar*, 19 USPQ2d 1111, 1117

RECEIVED

(Fed. Cir. 1991). A disclosure as filed is presumed to be adequate, unless the Examiner provides sufficient reasoning or evidence to rebut the presumption. *In re Marzocchi*, 169 USPQ 367, 370 (CCPA 1971). Thus, the Patent Office bears the initial burden of presenting evidence or reasons why skilled artisans would not recognize a description of the invention defined by the claims in an applicant's disclosure. *In re Wertheim*, 191 USPQ 90, 96 (CCPA 1976).

Further, every nuance of the claims need not be explicitly described in the specification to satisfy the written description requirement under 35 U.S.C. § 112. *Vas-Cath*, 19 USPQ2d at 1116. Thus, procedures or terms which are conventional or well known to those of skill in the art do not have to be disclosed in detail. *Hybritech v. Monoclonal Antibodies, Inc.*, 231 USPQ 81, 94 (Fed. Cir. 1988). Original claims constitute their own description and claim amendments or new claims must be supported by the description of the invention in the application as filed. *In re Koller*, 204 USPQ 702 (CCPA 1980); *In re Wright*, 9 USPQ2d 1649 (Fed. Cir. 1989).

Applicants point out that, although Claims 1-11, 14, 15, 19-36, 40, 41, 44, 50-52 and 57-67 have been rejected for lack of written description, the Examiner has not presented any evidence to support the rejection. Further, while the rejection is based upon an alleged lack of written description, the only reasoning provided focuses on "making and using" which are concerns of enablement, not written description. Thus, despite the plain language of the rejection, it is unclear as to whether the rejection is for lack of written description or lack of enablement. While written description and enablement are both within the purview of 35 U.S.C. § 112, first paragraph Applicants remind the Examiner that they are nonetheless distinct requirements. *Vas-Cath*, 19 USPQ2d at 1115; MPEP § 2161. Accordingly, the Examiner has failed to carry the burden of establishing lack of written description since the presumption of an adequate disclosure has not been rebutted.

The inventions defined by the pending Claims of the instant Application are sufficiently described in the original Specification and Claims to meet the legal standard for written description under 35 U.S.C. § 112, first paragraph. The amendment of the original Claims in the previous response included limitations that were described in the original Claims (see, pages 9 and 10 of the previous response). Accordingly, Applicants respectfully submit the pending Claims are adequately described in the original Claims as filed. Thus,

skilled artisans would clearly have understood Applicants to be in the possession of the inventions defined by the presently pending Claims at the time of the written Application as filed.

The inventions defined by the pending Claims of the instant Application are also clearly described in the Specification. More particularly, Applicants indicate where written description can be found in the Specification that refutes each of the allegations of inadequate written description advanced by the Examiner in the Office Action dated June 8, 2000. Immobilization of capture polynucleotides on porous substrates is described in the Specification at page 21, lines 20-34 to page 25, Example 7.1.3; and Example 7.1.4. Further, immobilization of different types and lengths of polynucleotides are well known in the art and are also described in the instant disclosure (Specification at page 14, lines 24-33 to page 16 lines 1-32; page 23, lines 11-34). An activated surface area with about  $6 \times 10^{-17}$  to about  $9 \times 10^{-15}$  nmol/nm<sup>2</sup> reactive groups and covalently attaching a capture polynucleotide to a porous substrate *via* a phosphodiester, phosphorothioate or phosphoroamidite linkage are also described in the Specification at page 18, lines 14-23; page, 22, lines 4-17; page 27, lines 29-30). Accordingly, Applicants respectfully submit the present Claims are adequately described in the Application as filed.

The enablement standard defined by 35 U.S.C. § 112, first paragraph requires that the disclosure of the patent application, supplemented with information known in the art, teach one of ordinary skill in the art to make or use the invention without undue experimentation. The patent disclosure is not required to teach, and preferably omits, what is well known in the art. *In re Buchner*, 18 USPQ2d 1331, 1332 (Fed. Cir. 1988); *Hybritech*, 231 USPQ at 94; *Lindemann Maschinenfabrik GMBH v. American Hoist & Derrick Co.*, 221 USPQ 481, 489 (Fed. Cir. 1984).

Applicants respectfully submit the Specification, as filed, satisfies the enablement requirement and address each of the allegations in the Office Action dated June 8, 2000. The Specification at page 32, lines 32-35; page 17, lines 1-21; page 20, to page 22, lines 1-27; Example 7.1.3; and Example 7.1.4 teach how to immobilize capture polynucleotides on porous substrates. Further, immobilization of different types and lengths of polynucleotides are well known in the art and are also enabled in the instant disclosure (Specification at page 14, lines 24-33 to page 16, lines 1-31; page 23, lines 11-34). The Specification at page 17,

lines 22-35 to page 19, lines 1-29; page 20, lines 16 to page 21, lines 1-28; page 26, lines 29-34 to page 27, lines 1-6; and page 27, lines 22-34 to page 29, lines 1-21, teaches activation of the porous substrate with a high density of reactive groups, including densities of reactive groups between about  $6 \times 10^{-17}$  to about  $9 \times 10^{-15}$  nmol/nm<sup>2</sup>. Covalently attaching a capture polynucleotide to a porous substrate *via* a phosphodiester, phosphorothioate or phosphoroamidite linkage is well known in the art and is taught by the Specification at page 18, lines 14-23; page, 22, lines 4-17; and page 27, lines 29-30.

Accordingly, Applicants respectfully submit that Claims 1-11, 14, 15, 19-36, 40, 41, 44, 50-52 and 57-67 satisfy both the written description requirement and enablement requirement of 35 U.S.C. § 112 and therefore request that the rejection of Claims 1-11, 14, 15, 19-36, 40, 41, 44, 50-52 and 57-67 under 35 U.S.C. § 112, first paragraph be withdrawn.

#### **THE REJECTIONS UNDER 35 U.S.C. § 112, SECOND PARAGRAPH**

Claims 10, 34, and 67 stand rejected under 35 U.S.C. § 112, second paragraph, as allegedly being indefinite for reciting the expression “high density or high molecular weight.” Applicants respectfully traverse the rejections.

Applicants respectfully point out that the use of relative terminology does automatically render claims indefinite under 35 U.S.C. § 112, second paragraph. MPEP § 2173.05(b). Acceptability of Claim language depends on whether one of ordinary skill would be apprized of the scope of the Claim. *Id.*

Amended Claims 10, 34, and 67 meet the legal standard enunciated above. Amended Claims 10, 34 and 67 recite the expression “high density or ultra-high molecular weight polyethylene” both of which are terms well known to one of ordinary skill in the art. Applicants submit as Exhibit B pages 1208 and 1209 of the Aldrich Handbook of Fine Chemicals, 1996-1997, Aldrich Chemical Company, 1001 West Saint Paul Avenue, Milwaukee, WI 53233, which indicates that one of ordinary skill in the art could readily determine the scope of amended Claims 10, 34 and 67 (See *e.g.*, 18,190-0, 42,798-5, 42-800-0, 43,426-4 and 43, 427-2 on pages 1208 and 1209 which describe the physical properties of commercially available high density or ultra-high molecular weight polyethylene). Thus, the scope of amended Claims 10, 34 and 67 are immediately apparent to those of ordinary skill in the art.

Claims 24, 25 and 36 stand rejected under 35 U.S.C. § 112, second paragraph, as allegedly being indefinite for reciting the expression “high stringency or low stringency or moderate stringency”. Applicants respectfully traverse the rejection.

Claims 24, 25 and 36 also meet the legal standard defined above, since high stringency, low stringency and moderate stringency are terms well known to one of ordinary skill in the art. Applicants submit as Exhibit C pages 81, 82, 93, 94, 105 and 106 of “*Nucleic Acid Hybridisation*” B.D. Hames and S.J. Higgins (eds.) IRL Press Limited, 1985, which indicates that one of ordinary skill in the art would be well apprized of the scope of Claims 24, 25 and 26. Further, conditions for high stringency, low stringency and moderate stringency hybridization are provided in the Specification at page 32, lines 18-34 to page 34, lines 1-20.

Accordingly, Applicants respectfully request that the rejection of Claims 10, 25, 26, 34 and 67 under 35 U.S.C. § 112, second paragraph be withdrawn.

#### **THE REJECTIONS UNDER 35 U.S.C. § 103(a)**

Claims 1-5, 8-11, 13-15, 21-29, 32-36, 40, 41, 44, 50-52, 58-60, 62-64, 66 and 67 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over EP 0 455 905 A2 to Van Ness *et al.* (“Van Ness”) in view of Fahy *et al.*, 1993, Nucl. Acids Res., 21:1819-1826 (“Fahy”) and further in view of Cumberland, Canadian Patent 1,110,511 (“Cumberland”). Applicants respectfully traverse the rejections on the grounds that the Examiner has failed to establish a case of obviousness.

Determination of the scope and content of the prior art is one of the key factual inquiries necessary for a determination of obviousness under 35 U.S.C. § 103(a). *Graham v. John Deere*, 148 USPQ 459, 467 (S. Ct, 1966). A reference must be from analogous prior art if it is used as the basis for a rejection under 35 U.S.C. § 103(a). MPEP § 2141.01(a). Otherwise “the combination of elements from non-analogous sources, in a manner that reconstructs the applicant’s invention only with the benefit of hindsight is insufficient to present a *prima facie* case of obviousness.” *In re Oetiker*, 24 USPQ2d 1443, 1446 (Fed. Cir. 1992).

Two criteria determine whether the prior art is analogous. *In re Deminski*, 230 USPQ 313, 315 (Fed. Cir. 1986). First, is the reference in the field of the inventor’s endeavor? *Id.*

If the reference is not in the field of the inventor's endeavor then the reference must be reasonably pertinent to the particular problem with which the inventor was concerned. *Id.* A reference is reasonably pertinent even if it is in a field different from the inventor's endeavor when it would have logically have come to the inventor's attention in considering his problem. *In re Clay*, 23 USPQ2d 1058, 1060 (Fed. Cir. 1992). The purposes of both the invention and the prior art are important in determining whether the reference is reasonably pertinent to the problem the invention attempts to solve. *Id.*

Cumberland teaches a unidirectional fluid flow membrane that can be used as an overpressure valve in life jackets or an exhaust diaphragm in underwater mask, snorkel or regulator. The flow membrane is comprised of sheets of porous plastic material, which have been glazed on one surface to reduce the pore size of the material on that surface. Liquids, such as water are unable to penetrate the glazed surface, which remains permeable to gases. The cited reference teaches that this type of membrane is useful in underwater equipment because the membrane functions as a check valve with respect to liquids.

Applicants respectfully submit that Cumberland is non-analogous art and therefore cannot be used as a reference in a rejection under 35 U.S.C. § 103(a). Cumberland never discusses either nucleic acids or using membranes in biological and/or chemical applications. Accordingly, Cumberland is not in the field of the current invention but rather in the area of underwater equipment.

Further, Cumberland is not reasonably pertinent to the particular problem which is the concern of the current invention. The purpose of the Cumberland reference is providing a non-mechanical check valve that can be used in underwater equipment.

The current invention solves problems such as capacity, flow rate, clogging and sample recovery in nucleic acid hybridization and capture methods, all of which are significant issues with prior art flow through hybridization devices (Specification at page 10, lines 5-34 to page 11, lines 1-8). The purpose of the current invention is to provide methods and apparatus for flow through hybridization.

Applicants have shown above that Cumberland and the current invention have different purposes. The cited reference does not discuss any of the problems solved by the current invention. Accordingly, Cumberland would not have logically come to the attention of inventors solving problems in the flow through hybridization art. Rational inventors

simply would not consult the underwater equipment arts to find solutions to problems in the flow through hybridization arts.

Applicants have shown above that Cumberland is not in the field of the current invention and is not reasonably pertinent to the particular problem which is the concern of the current invention. Therefore, Cumberland is non-analogous art and cannot be used to establish a case of obviousness under 35 U.S.C. § 103(a).

Accordingly, Applicants respectfully request that the rejection of Claims 1-5, 8-11, 13-15, 21-29, 32-36, 40, 41, 44, 50-52, 58-60, 62-64, 66 and 67 under 35 U.S.C. § 103(a) be withdrawn.

Claims 1-3, 8-11, 13-15, 21-27, 29, 32-36, 40, 41, 44, 50-52, 58-60, 62-64, 66 and 67 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over EP 0 605 828 A1 to Feindt *et al.* ("Feindt") in view Cumberland. Applicants respectfully traverse the rejections for the reasons advanced above. Accordingly, Applicants respectfully request that the rejection of Claims 1-3, 8-11, 13-15, 21-27, 29, 32-36, 40, 41, 44, 50-52, 58-60, 62-64, 66 and 67 under 35 U.S.C. § 103(a) be withdrawn.

Claims 1-3, 5, 7-11, 13-15, 21-27, 29, 31-36, 40, 41, 44, 50-52, 58-60, 62-64, 66 and 67 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Tam, United States Patent No. 5,741,647 ("Tam") in view Cumberland. Applicants respectfully traverse the rejections for the reasons advanced above. Accordingly, Applicants respectfully request that the rejection of Claims 1-3, 8-11, 13-15, 21-27, 29, 32-36, 40, 41, 44, 50-52, 58-60, 62-64, 66 and 67 under 35 U.S.C. § 103(a) be withdrawn.

## **CONCLUSION**

Applicants respectfully submit Claims 1-11, 14, 15, 19-36, 40, 41, 44, 50-52 and 57-67 satisfy all of the criteria for patentability and are in condition for allowance. An early indication of the same and passage of the claims to issuance is therefore kindly solicited.

No fees are believed due in connection with this Amendment. However, should the Commissioner determine otherwise, he is authorized to charge all required fees to Pennie & Edmonds LLP Deposit Account No. 16-1150. Any over payments may be also credited to the above deposit account.

Respectfully submitted,

Date September 8, 2000

Samuel B. Abrams by Samuel K. Singh 45,298  
30,605

Samuel B. Abrams

(Reg. No.)

**PENNIE & EDMONDS** LLP  
1155 Avenue of the Americas  
New York, N.Y. 10036-2711  
(212) 790-9090

Enclosures